CLAIMS

[0038] What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. A method of controlling the thermo-optic behavior of an optical path over a temperature range comprising the steps of:

determining specifications upon a figure of merit (FoM) for said path; and

including a body of $NaBi(Mo_{1-x}W_xO_4)_2$ crystalline material in said path, said body of $NaBi(Mo_{1-x}W_xO_4)_2$ crystalline material having a coefficient of thermal expansion (CTE) and a refractive index change with temperature (dn/dT) that are mutually adapted to satisfy at least one FoM specification over said temperature range.

2. The method of claim 1, wherein said optical path is defined by a temperature insensitive $NaBi(Mo_{1-x}W_xO_4)_2$ etalon and said FoM is determined to be CTE + (1/n)(dn/dT), where n is the refractive index of the crystalline material of said $NaBi(Mo_{1-x}W_xO_4)_2$ etalon and said FoM is small or essentially zero.

3. The method of claim 2, wherein dn/dT is relatively insensitive to temperature and wavelength over a predetermined operating range.

4. The method of claim 1, wherein x = 0.25 and said FoM is essentially zero.

5. A device comprising:

an optical path characterized by a figure of merit (FoM); and

a body of $NaBi(Mo_{1-x}W_xO_4)_2$ crystalline material disposed in said path, said body of $NaBi(Mo_{1-x}W_xO_4)_2$ crystalline material having a coefficient of thermal expansion

(CTE) and a refractive index change with temperature (dn/dT) that are mutually adapted to satisfy an FoM specification over a temperature range.

6. The device of claim 5, wherein said optical path is defined by a temperature insensitive $NaBi(Mo_{1-x}W_xO_4)_2$ etalon and said FoM is determined to be CTE + (1/n)(dn/dT), where n is the refractive index of the crystalline material of said $NaBi(Mo_{1-x}W_xO_4)_2$ etalon, and said FoM small or essentially zero.

7. The device of claim 6, wherein dn/dT of the wavelength discriminating component is relatively insensitive to temperature and wavelength over the operating range of interest.

8. The device of claim 5, wherein x = 0.25 and said FoM is essentially zero.

9. A WDM optical transmitter for operation over a range of temperatures, comprising:

a source for generating an output signal at any one of a multiplicity of different wavelengths;

means for tuning the wavelength of said source to a predetermined one of said wavelengths; and

a feedback loop including a frequency discriminator for stabilizing the wavelength of said source at said predetermined wavelength, said frequency discriminator including a $NaBi(Mo_{1-x}W_xO_4)_2$ etalon, said etalon having a FoM and a CTE and a dn/dT that are mutually adapted to satisfy a desired FoM specification over said range of temperatures.

10. The WDM optical transmitter of claim 9, wherein said dn/dT of the wavelength discriminating component is relatively insensitive to temperature and wavelength over a predetermined operating range.

11. The WDM optical transmitter of claim 9, wherein said etalon is essentially temperature insensitive and said FoM is essentially zero.

12. The WDM optical transmitter of claim 9, wherein said means for tuning the wavelength of said source comprises a temperature controller.

13. The WDM optical transmitter of claim 9, wherein said means for tuning the wavelength of said source comprises electronic means.

14. A method of transmitting an optical signal over a range of temperatures comprising the steps of:

generating an output signal at any one of a multiplicity of different wavelengths;

tuning the wavelength of said output signal to a predetermined one of said wavelengths; and

stabilizing the wavelength of said source at said predetermined wavelength by employing a $NaBi(Mo_{1-x}W_xO_4)_2$ etalon, said etalon having a FoM and a CTE and a dn/dT that are mutually adapted to satisfy said FoM over said range of temperatures.

15. The method of claim 14, wherein said dn/dT of the wavelength discriminating component is relatively insensitive to temperature and wavelength over a predetermined operating range.

16. The method of claim 14, wherein said etalon is essentially temperature insensitive and said FoM is essentially zero.